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Title: Restoration and long term monitoring of
peregrine falcons on the Channel Islands

**Restoration and Long Term Monitoring of
Peregrine Falcons on the Channel Islands**

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INTRODUCTION:

The American peregrine falcon (*Falco peregrinus anatum*) is a bird-eating predator of both aquatic and terrestrial ecosystems. DDT causes eggshell thinning in birds including peregrines, with a resultant loss of productivity of fledglings, and eventually a reduction in adults available to enter the breeding population. The peregrine declined precipitously in North America following the application of DDT beginning in the 1940s. The California population suffered over a 90% loss of territorial pairs, with a low total known population of two pairs in 1970 where formerly there had been hundreds of known pairs. The Channel Islands population, which historically was 15-20 pairs, was eliminated by the 1970s.

Restriction of DDT use, and a four million dollar direct intervention restoration management program (including captive breeding and captive incubation of thin-shelled wild eggs), began in the 1970s. Over 700 fledglings were added to the population via fostering, cross-fostering and hacking. This resulted in restoration of the peregrine to much of its former range in California by 1994.

Although peregrines have been recovering in some areas of their range, no recovery was observed in the Channel Islands area until restoration efforts were initiated in the mid-1980s. With hacking, birds of natal origin in the Channel Islands area were established and returned to nest or attract wandering immatures from other areas of the population where productivity was occurring. However, only about one-third of the historical nesting areas have been reoccupied, and the population continues to exhibit the effects of DDT contamination. The intent of this restoration program would be to restore a stable and healthy population of peregrines throughout the Channel Islands.

ECOLOGICAL BENEFITS:

The primary measure of success for this project will be the return of a stable and healthy population of peregrine falcons on all of the Channel Islands. Without the administrative and direct management actions, the recovery period will be considerably longer, possibly decades. With hacking, the rate of recovery of the population will increase and reduce the chances of future extinctions or continued limitation to a reduced population size in the area due to continuing pesticide impacts.

Hacked birds can bolster the existing productivity until pesticide impacts diminish, and greatly increase the chances of birds becoming resident on islands that are currently vacant. Without hacking and related restoration efforts, the future of the existing Channel Islands population is not known and the re-occupancy of the remaining four vacant islands may not occur.

Information will be obtained on the success of the restoration effort, and on the continuing health and status of peregrines in the Southern California Bight. Without monitoring, peregrines could again experience large-scale undetected declines and possibly face extinction or the need for renewed expensive hands-on management programs.

The secondary benefits of the project would include acquisition of information on changes in status and pesticide contamination in other species, and other ecological indications concerning health and biodiversity of the ecosystem. Few if any other species can offer the opportunities provided by the peregrine with its wide range of habitat use, its interaction in both aquatic and terrestrial food webs, and its sensitivity to pesticide contamination. Without the ecological indications of this monitoring effort, more expensive monitoring of a variety of species lower in the food web would be required, or undetected changes in biodiversity and pesticide contamination could occur.

Information useful to land and wildlife managers with jurisdiction of regions within the study area will make future planning, management, and protection efforts more feasible and economical. Public education regarding ecology and recovery of endangered species and the value of good ecosystem health and management will increase.

Annual analysis of prey species provides information on the status of changes in the complex aquatic and terrestrial food webs associated with peregrine nesting territories. Collection and analysis of addled eggs, eggshell fragments, and opportunistically sampled or salvaged tissues can be used to monitor concentrations of pesticides and other chemicals in the environment. Continued monitoring of peregrines can provide long-term indication of the ecological health of the environment as contaminated areas, such as the Southern California Bight, are cleaned up.

SPECIFIC PROJECTS:

Description:

This report describes the work necessary for restoration of peregrine falcons to the Southern California Bight, including all eight of the Channel Islands. These falcons were eliminated as a breeding population due to DDT induced eggshell thinning and resulting population declines in the 1950s and 1960s. The restoration program described here would continue the recovery effort until a reoccupation of a total of 20 territories on all islands has occurred and a stable population with normal productivity and recruitment has been developed. A monitoring effort is included to determine the success of the restoration effort and to document any future impacts due to pesticides on the recovering population. The peregrine is an effective ecological barometer of the health and pesticide contamination of the aquatic and terrestrial ecosystems of the Channel Islands. Through restoration and monitoring, this species can again become an important part of the ecology of the Channel Islands region.

Achievement of the goal of successful restoration of a stable population of peregrines on the Channel Islands will require several programs in the Southern California Bight over an extended period of years.

In the first few years, three programs need to be completed. First, a restoration management plan for future activities needs to be produced. Second, hacking of young on vacant islands needs to occur. Third, the origin of visiting, wintering peregrines needs to be determined by satellite tracking.

The other necessary programs include ongoing monitoring of the success of these three programs and of the overall restoration. That effort should include: 1) annual surveys of recently utilized territories for occupancy, 2) surveys of historic and suitable habitat to determine newly occupied or currently vacant territories, 3) determination of productivity at occupied territories, 4) marking of nestlings with USFWS and visual identification (VID) bands to chart dispersal and turnover, 5) marking of any unbanded adults with USFWS and VID bands to promote understanding of population dynamics, including territorial movements and mortality, 6) winter monitoring of the population to determine range, prey species utilization and sources of pesticide contamination, 7)

collection of prey remains from nests and vicinity after fledgling of young, 8) collection of addled eggs and eggshells after nest failures, during banding efforts, or while collecting prey remains after fledgling, 9) laboratory analysis of eggshells, addled eggs, tissues, and any salvaged peregrine or prey carcasses, and 10) coordination with various agencies and management teams.

Technical Feasibility:

The overall peregrine restoration effort has been successful elsewhere in California. The techniques are accepted and governing agencies are familiar with and have historically approved these activities. Initial efforts to begin restoration on the Channel Islands have also been successful so activities proposed are actually a continuation of previous programs that have been approved and permitted by USFWS, CDFG, and NPS. The potential for successful implementation of these programs is, as a result, very high. The expertise to conduct specialized field and lab procedures has been developed, and expert personnel are available to conduct the work.

The restoration work proposed here would involve the Santa Cruz Predatory Bird Research Group or a similar contractor, in conjunction with United States Fish and Wildlife Service, California Department of Fish and Game, National Park Service, Department of Defense, and Recovery and Working Teams.

Personnel include the principal investigator, a program administrator, a field restoration coordinator, field technicians, a lab analysis coordinator, and lab technicians (see attached material for brief job descriptions).

Time: This proposed study would involve field, lab and office work for 20 years. Spring field work would largely be conducted February through July each year. Winter field work would be conducted from October-January. Lab work would be conducted following field collections each breeding season from August to January. Office work would be conducted year round, especially in the fall and winter (August to January) when report writing and most meetings occur.

Area: Primary focus would be on birds in the Channel Islands, coastal southern California, and the Big Sur portion of the peregrine falcon's range. Hacking would

Area: Primary focus would be on birds in the Channel Islands, coastal southern California, and the Big Sur portion of the peregrine falcon's range. Hacking would occur on the four southernmost Channel Islands. With satellite tracking, effects of Southern California Bight pollution on peregrines wintering in the area and then returning to nest outside the area will be monitored.

All proposed programs are covered by existing permits; however, permits and MOUs would likely need to be updated and modified over time. All work would be coordinated by USFWS and CDFG through staff, recovery plans, and Recovery and Working Team meetings. Similar work has occurred in the past, so new laws or policies are not required.

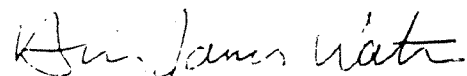
Cost:

Planning: Planning costs for restoration and monitoring work are contained within the operating budget for the twenty year program needed to restore the peregrine and monitor its future status. The costs in current dollars for the initial shorter-term portions of the effort—hacking, management planning, and satellite tracking—are provided in supplements A, B, and C, respectively.

Construction: No construction costs are anticipated.

Operation: The approximate annual budget in current dollars for one of 20 years for restoration and monitoring of status is attached to this report.

Monitoring: This report describes restoration of the peregrine population and the monitoring to determine the success and future impacts of pesticides on the restoration effort. Monitoring costs are thus included in the attached operating budget.



Brian James Walton

OPERATION BUDGET
PEREGRINE FALCON RESTORATION (SANTA CRUZ PREDATORY BIRD RESEARCH GROUP)
Proposed Annual Budget - Year One (20 Year Restoration and Monitoring Effort)

TITLE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Principal Investigator/ Restoration Program Coordinator	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	48,000
Administrative Assistant	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	36,000
Field Restoration Coordinator	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	30,000
Field Technician/ Peregrine Nests	2,500	2,500	2,500	2,500	2,500	2,500	2,500	-	-	2,500	2,500	2,500	25,000
Nest Site Attendants	-	-	7,500	7,500	7,500	5,500	-	-	-	-	-	-	28,000
Lab Coordinator	2,500	-	-	-	-	-	-	2,500	2,500	2,500	2,500	2,500	15,000
Lab Technician/Pesticides	2,000	-	-	-	-	-	-	2,000	2,000	2,000	2,000	2,000	12,000
Lab Technician/Eggshells	-	-	-	-	-	-	-	1,500	1,500	-	-	-	3,000
TOTAL SALARIES													\$197,000
Benefits @ 20%													\$39,400
TOTAL SALARIES & BENEFITS													\$236,400
Office	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	18,000
Lab/Chemicals/Instruments	4,000	-	-	-	-	-	-	4,000	4,000	4,000	4,000	4,000	24,000
Travel/Car/Boat/Plane	3,500	5,000	5,000	5,000	5,000	5,000	2,500	1,000	1,000	2,000	2,000	2,000	39,000
Field Equipment/Transmitters	500	1,000	500	500	500	500	500	-	-	1,500	-	-	5,500
Other Direct Costs													\$86,500
TOTAL DIRECT COSTS													\$322,900
CAMPUS Coordination @ 24.4% rate													\$78,788
TOTAL SCPBRG BUDGET													\$401,688
Agency Coordination and Support @ 40% of Total Direct Costs													\$129,160
TOTAL BUDGET													\$530,848

This budget covers peregrine falcon restoration effort toward recovery in Southern California.
It does not cover other SCPBRG projects and programs that will occur simultaneously.

**A. SUPPLEMENT TO TWENTY-YEAR RESTORATION BUDGET
HACKING ON CHANNEL ISLANDS WITHOUT KNOWN PEREGRINE NESTS**

BUDGET:

Salaries:	P.I./Administrator (in 20 year budget)	
	Field Research Tech. (in 20 year budget)	
	Site 1: 2 Hack Site Att. (1000/mo x 2/mo)	4,000
	Site 2: 2 Hack Site Att. (1000/mo x 2/mo)	4,000
	Site 3: 2 Hack Site Att. (1000/mo x 2/mo)	4,000
Benefits:	20% of salaries	2,400
Field Work:	Young Peregrines for Release	18,000
	Hack Site Development (4 towers at \$500/ea)	2,000
	Travel (car 11,364 miles at .22)	<u>2,500</u>
Total Direct Costs:		\$36,900
UCSC Coordination:	24.4%	9,004
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Total UCSC Budget:		\$45,904
Agency Coordination and Support: 40% of Total Direct Costs		\$14,760
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TOTAL BUDGET		\$60,664

\$60,664 a year for 5 years

B. SUPPLEMENT TO TWENTY-YEAR RESTORATION BUDGET

**WRITE PEREGRINE RESTORATION MANAGEMENT PLAN
FOR CHANNEL ISLANDS AREA**

BUDGET:

Salaries:	Principal Investigator (in 20 year budget) Research Coordinator (in 20 year budget) Assistant (in 20 year budget)	
Benefits:	(in 20 year budget)	
Report Production:	Phone/Xerox/Mail/Duplicating/Graphics	<u>3,000</u>
Total Direct Costs:		\$3,000
UCSC Coordination:	24.4%	732
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Total UCSC Budget		\$3,732
Agency Coordination and Support: 40% of Total Direct Costs		\$1,200
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TOTAL BUDGET		\$4,932

\$4,932 a year for 1 year

C. SUPPLEMENT TO TWENTY-YEAR RESTORATION BUDGET

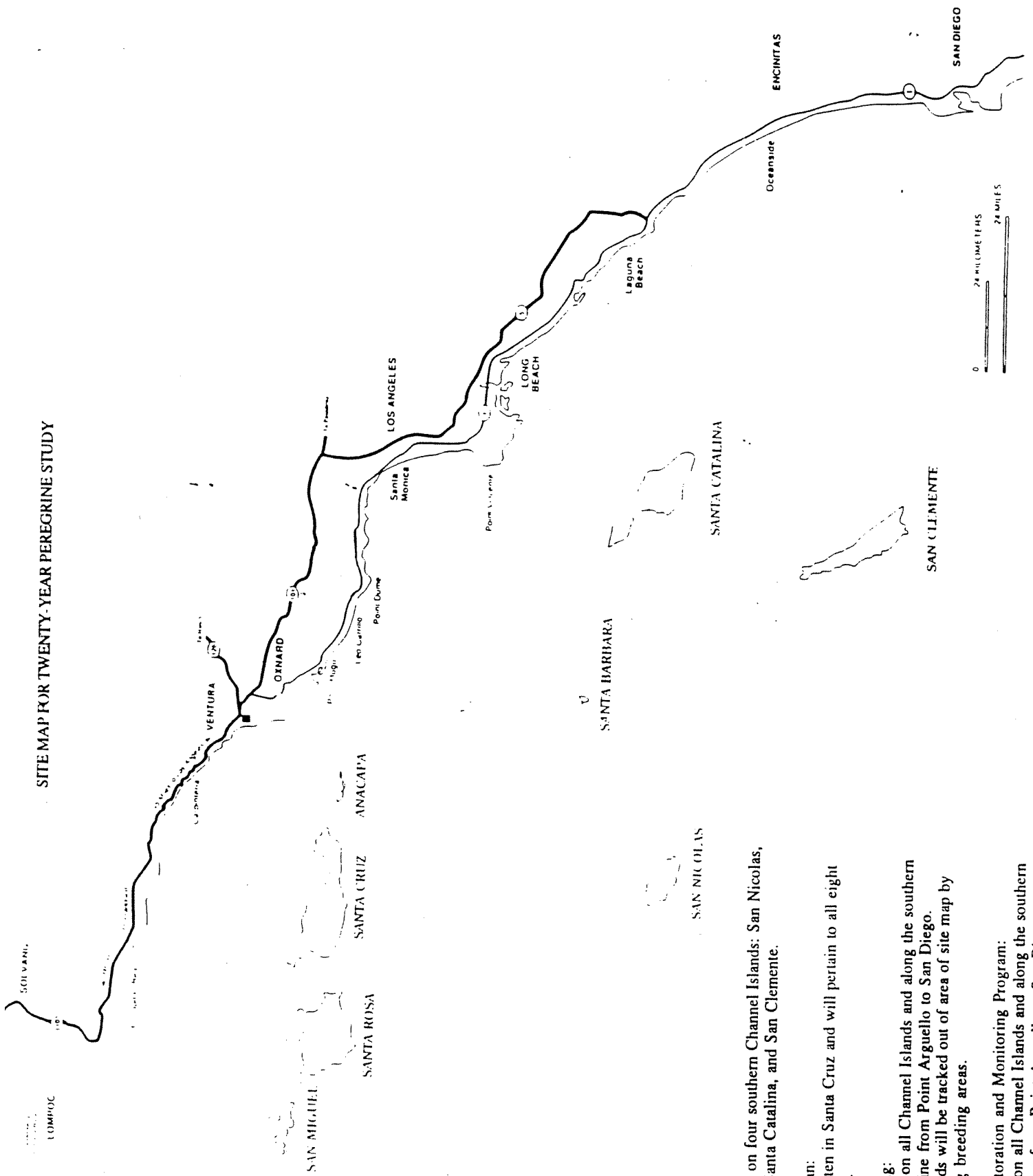
**SATELLITE TRACKING OF WINTER PEREGRINE
VISITORS TO CHANNEL ISLANDS**

BUDGET:

Salaries:	P.I./Administrator (in 20 year budget)	
	Field Research Coord. (in 20 year budget)	
Benefits:	(in 20 year budget)	
Equipment:	Transmitters (3 at \$2,500)	7,500
	Satellite/computer time	5,000
Travel:	Car (13,636 miles at .22)	<u>3,000</u>
Total Direct Costs:		\$15,500
UCSC Coordination:	24.4%	3,782
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Total UCSC Budget:		\$19,282
Agency Coordination and Support: 40% of Total Direct Costs		\$6,200
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TOTAL BUDGET		\$25,482

\$25,482 a year for 2 years

SITE MAP FOR TWENTY-YEAR PEREGRINE STUDY



Hacking:
Study will occur on four southern Channel Islands: San Nicolas, Santa Barbara, Santa Catalina, and San Clemente.

Management Plan:
Plan will be written in Santa Cruz and will pertain to all eight Channel Islands.

Satellite Tracking:
Study will occur on all Channel Islands and along the southern California coastline from Point Arguello to San Diego. Transmitted birds will be tracked out of area of site map by satellite to spring breeding areas.

Twenty-year Restoration and Monitoring Program:
Study will occur on all Channel Islands and along the southern California coastline from Point Arguello to San Diego.